

## REMARKS

Claims 13-17, 34-39, 42-44, 48-52, 56, and 58-62 are currently pending in this application.

### Rejections

#### 35 U.S.C. § 103(a)

Claims 13-17, 35-39, 43, 44, and 58-61 were rejected under 35 U.S.C. §103(a) as allegedly unpatentable over U.S. Patent No. 5,075,226 Kaneko *et al.* (December 24, 1991) (hereinafter "Kaneko").

Applicants respectfully disagree and traverse this rejection.

Pending claim 13 is drawn to an isolated starter culture comprising at least one modified lactic acid bacterial cell wherein said at least one modified lactic acid bacterial cell comprises at least 0.1 ppm on a dry matter basis of a porphyrin compound which includes iron, wherein said at least one modified lactic acid bacterial cell is obtainable by culturing in a medium containing a protoporphyrin compound or its complexes with an iron atom, wherein said starter culture is in the form of a frozen or freeze-dried culture, and wherein said starter culture comprises an amount of viable modified lactic acid bacterial cells which is at least  $10^8$  CFU per gram. Applicants respectfully submit that the claimed subject matter is not rendered obvious by the teachings of Kaneko.

The Office Action states (in part):

Kaneko *et al* teach culturing lactic acid bacteria in haemin (e.g., at a concentration of 0.1-500  $\mu$ M), and the culture solution or a concentrate thereof is used to increase or improve the flavor of foods (column 5, lines 6-10). Although the reference does not specifically indicate the form of the *Lactococcus lactis* cells, since the culture solution is used to increase or improve the flavor of foods, it would be expected that the culture solution would be concentrated or isolated in various forms (e.g., either in liquid, frozen or freeze-dried form) for subsequent use.

See Office Action, page 4, lines 2-8.

Applicants respectfully submit that the bacterial cultures as described by Kaneko are used to produce diacetyl and acetoin, but that there is no discussion or contemplation of isolating any starter culture from the fermentation process in Kaneko. The Office Action quotation provided above reinforces Applicants' assertion that the claimed invention is non-obvious. As stated in the Office Action, "the culture solution or a concentrate thereof is used to increase or improve the flavor of foods (column 5, lines 6-10)." See Office Action, page 4, lines 3-4. This quotation demonstrates that the culture solution produced *via* the culturing process (or a concentrate thereof) is used to increase or improve the flavor of foods. This is an end use. In other words, the resulting solution or concentrate thereof is added to a food product(s) which is intended for consumption. Kaneko does not suggest using any cells, culture solutions or concentrates derived from the fermentation process for subsequent culturing steps or as a starter culture.

To the contrary, Kaneko teaches that "[t]he culture solution or a concentrate thereof can be used to increase or improve the flavor of foods such as butter, margarine, cheeses, shortening, confectionery, creams, etc., in only small amounts." See Kaneko, column 5, lines 6-10. As stated previously, this teaching by Kaneko is an end use, leading ultimately to the consumption of the culture solution or concentrates as a food component. Applicants submit that it is likely that the resulting diacetyl/acetoin would be isolated from impurities and other unwanted components in the culture medium before addition as a flavor enhancer to butter, cheeses, etc. Applicants submit that components such as animal tissue and living bacterial cells are likely unwanted components of a flavor enhancer for cheeses and butter, for example. Furthermore, Applicants submit that a culture solution is different than a culture medium, as a culture solution may reference, for example, a filtrate of the culture medium.

The Office Action also states that "it would be expected that the culture solution would be concentrated or isolated in various forms (e.g., either in liquid, frozen or freeze-dried form)." While not acquiescing in the statement that frozen and freeze dried forms of the culture solution would be expected from the teachings of Kaneko (which do not mention freeze-dried, frozen, or starter cultures), Applicants submit that Kaneko does not teach or suggest using any cells, culture solutions or concentrates derived from the fermentation process for subsequent culturing steps.

Furthermore, it is Applicants' understanding that the substance increasing or improving the flavor of foods in the culture solution or concentrate is the mixture of diacetyl and acetoin, and not the *Lactococcus lactis* bacterial cells themselves. Kaneko does not instruct one of

ordinary skill in the art to include the *Lactococcus lactis* cells in the culture solution that is added as a flavoring agent. For example, Kaneko states that “[d]iacetyl and acetoin in the culture can be concentrated by distillation, etc.” See Kaneko, last line of column 4 extending to the first line of column 5. Applicants submit that it is unclear whether bacterial cells would even survive a distillation process, let alone be useful as a starter culture.

As stated previously, there is no discussion or contemplation of the isolation or harvesting of these bacteria from the end products *following completion of the fermentation process* described in Kaneko for any use, much less as an isolated starter culture. See Kaneko, Examples 1-5. Accordingly, Applicants submit that claim 13 is not obvious in light of the teachings of Kaneko. The remaining rejected claims depend from claim 13 and incorporate all of the elements of claim 13, and therefore are not obvious on the same grounds that claim 13 is not obvious. Applicants respectfully request reconsideration and withdrawal of the rejection of claims 13-17, 35-39, 43, 44, and 58-61 under 35 U.S.C. §103(a) as allegedly unpatentable over Kaneko.

## Objections

Claims 34, 48-52, 56 and 62 were objected to as depending from a rejected claim. Applicants submit that claim 13 is not obvious for all of the reasons set forth above, and is therefore allowable. Accordingly, the objected claims should also be allowable for the same reasons as set forth above. Applicants respectfully request reconsideration and withdrawal of the objection to claims 34, 48-52, 56 and 62.

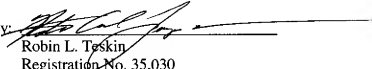
**CONCLUSION**

An indication of allowance of all claims is respectfully solicited. Early notification of a favorable consideration is respectfully requested. In the event any issues remain, Applicants would appreciate the courtesy of a telephone call to their counsel to resolve such issues and place all claims in condition for allowance.

Respectfully submitted,

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